

# **Report Topic**

## **Report to the Legislature: Options to Increase Waste Tire Diversion Rates**



California Department of Resources Recycling and Recovery

**May 2008**

**S T A T E   O F   C A L I F O R N I A**

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NOTE: Subsequent to the completion of this study and the preparation of this report, legislation (SB 63, Strickland) signed into law by Gov. Arnold Schwarzenegger eliminated the California Integrated Waste Management Board and its six-member governing board effective Dec. 31, 2009.

CIWMB programs and oversight responsibilities were retained and reorganized, effective Jan. 1, 2010, and merged with the beverage container recycling program previously managed by the California Department of Conservation.

The new entity is known as the Department of Resources Recycling and Recovery (CalRecycle) and is part of the California Natural Resources Agency. It is no longer part of the California Environmental Protection Agency (Cal/EPA), which is referenced throughout this report.

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# Background

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In 1989 the California Legislature enacted Assembly Bill (AB) 1843 (Brown, Statutes of 1989, Chapter 974), which that charged the California Integrated Waste Management Board (Board or CIWMB) with administering the Waste Tire Recycling Management Program (Tire Program). This bill, titled the California Tire Recycling Act, was designed in part to reduce the flow of California scrap tires to landfills and stockpiles through the further development of markets in the state for scrap tires. AB 1843 was originally scheduled to expire in 1999, but the Legislature passed AB 117 (Escutia, Statutes of 1998, Chapter 1020) in 1998 and postponed this first sunset date until January 2001. With the passage of Senate Bill (SB) 876 (Escutia, Statutes of 2000, Chapter 838) in 2000, the California Tire Recycling Act was permanently renewed and expanded.

SB 876 was enacted as a comprehensive measure to extend and expand California's regulatory program related to the management of waste and used tires. One of the key provisions of the measure required the CIWMB to adopt and submit to the Legislature a five-year plan on or before July 1, 2001, including budget allocations. Further, the plan must be updated every two years. The current *Five-Year Plan for the Waste Tire Recycling Management Program (4<sup>th</sup> Edition Covering Fiscal Years 2007/08-2011/12) Report to the Legislature* can be found at: <http://www.ciwmb.ca.gov/Publications/Tires/62007004.pdf>

For 2006, the CIWMB estimates 74 percent of the waste tires generated were diverted from disposal or stockpiles. This represents a major accomplishment compared with the approximate diversion rate of 33 percent in 1990. However, about 11 million tires are still being landfilled in California each year. Furthermore, while the CIWMB annually spends more than \$30 million on a suite of tire enforcement and market development programs, the Tire Recycling Management Fund (Tire Fund) currently has a reserve balance of \$42 million (Tire Fund Reserve). This reserve is projected to increase to approximately \$58 million by Fiscal Year (FY) 2009/10.

In 2007, the Legislative Analyst's Office (LAO) "*recommended the adoption of supplemental report language to require the Board to report on options, and related statutory changes, that it would recommend to increase the diversion rate. Further, the LAO has acknowledged the Board as best positioned to identify those additional efforts most likely to increase the number of waste tires diverted from the state's landfills, as well as to advise the Legislature of the policy choices that may be inherent in such efforts warranting legislative evaluation.*" In the Budget Act of Fiscal Year 2007/08, the Legislature required the CIWMB to submit a report by July 10, 2008, that identifies the following:

- A history of revenues, expenditures, and balances of the California Tire Recycling Management Fund since its inception, and projection of such information for 2008-09 and the subsequent two fiscal years.
- A history of waste tire diversion rates and end uses, and projection of such rates and uses for 2007 and the subsequent three years.
- Identification and assessment of the costs and effectiveness of options to increase the rate of diversion of waste tires from disposal in landfills.

- Any statutory changes that would assist the CIWMB's efforts to increase the diversion rate.

The CIWMB conducted an Interested Parties meeting on January 24, 2008, to obtain input from stakeholders. In addition, CIWMB staff presented a draft report to the Board in March 2008 to provide stakeholders and the Board the opportunity to discuss the recommendations.

## **2006 Generation, Diversion, and Disposal Rates and Projections**

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For 2006, the CIWMB estimates that 44.4 million waste tires were generated in California, with 33.0 million waste tires, or 74 percent, diverted from disposal or stockpiles. In 1990, 9.2 million waste tires of the 27 million generated were diverted. The number of waste tires diverted has more than tripled from 1990 to 2006. Staff estimates that, given existing market dynamics and market development efforts, the diversion rate will increase to about 83 percent by 2010 (see Chart 1 on next page). Nationally, estimated diversion is higher, at 87 percent in 2005, in part because tire-derived fuel (TDF) accounts for about one-half of the total national tire market but only 11 percent of the California market. Because of California's public opposition to the burning of waste tires, the use of TDF is limited to fuel to energy for cement kilns and cogeneration plants. Nationally, tires are used widely in the pulp and paper industry and industrial and utility boilers, as well as fuel for energy and cement kilns.

Chart 1 provides the generation, diversion, and disposal rates for 2004-2006 and projections for 2007-2010. These projections are based on discussions with major industry representatives regarding their 2007 tire markets and their future projections. A market analysis was approved in the current Five-Year Plan to provide a two-year assessment of tire-derived product market trends, performance indicators, raw material supply flow, and future market conditions. This analysis will specifically address material and product flow through the marketplace and establish a mechanism to periodically update market data so that the most current information is available to decision makers. Once completed, this study will be used to validate the data used in the California Waste Tire Generation, Markets, and Disposal Staff Report. This analysis is being conducted under the Tire-Derived Product Business Assistance Program (TBAP).

**Chart 1: Generation, Diversion, and Disposal Rates for 2004-2006 and Projections for 2007-2010**

(Numbers in millions of passenger tire equivalents [PTE])

Year	Estimated generation	Reuse	Crumb Rubber	RAC	Civil Engi.	ADC	Agriculture & Others	Retread	Export	TDF (Power)	TDF (Cement)	Import	Diverted	Disposal	Diversion Rate
2004	43.3	1.6	3.5	2.7	1.2	4.5	2.9	4.4	3.1	1.4	6.7	1.4	30.6	12.7	71%
2005	42.5	1.2	3.4	2.0	2.0	4.7	3.1	4.4	2.3	1.7	7.4	1.5	30.7	11.8	72%
2006	44.4	2.1	2.7	3.9	3.3	4.5	3.3	4.4	1.9	1.3	7.0	1.4	33.0	11.4	74%
2007	43.1	2.1	3.2	4.3	3.8	4.0	3.3	4.4	2.0	1.3	7.0	1.2	34.2	8.9	79%
2008	44.8	2.1	3.6	4.7	5.0	4.0	3.3	4.5	2.0	1.3	7.0	1.2	36.3	8.5	81%
2009	46.2	2.1	4.0	5.2	5.5	3.8	3.3	4.8	2.0	1.3	7.0	1.1	37.9	8.3	82%
2010	46.9	2.1	4.4	5.7	6.0	3.5	3.3	4.8	2.0	1.3	7.0	1.0	39.1	7.8	83%

**Note:** A survey of industry representatives was conducted to determine their 2006 tire market and their future projections for 2007-2010. The following assumptions are based on that survey:

1. "Reuse" tires remains unchanged.
2. "Crumb Rubber" projected 10 percent increase annually based on growth in the market.
3. Rubberized Asphalt Concrete (RAC) projected 10 percent increase annually based on growth in the market.
4. "Civil Engineering" increases in projected projects and the increase in TDA use at landfills.
5. Alternative Daily Cover (ADC) decreases a small amount based on market demand for crumb and tire-derived aggregate (TDA) will divert some tires that other wise would be used as ADC.
6. "Agriculture and Other Uses" remains unchanged.
7. "Retread" slightly increases in 2008 and then around 10 percent increase for 2009 and 2010 as projected by Tire Retread Information Bureau.
8. "Export" remains unchanged.
9. Tire-Derived Fuel (TDF) for power and cement kiln remains unchanged.
10. "Import" tires decreases a very small amount.
11. For 2006, staff identified 0.8 million PTE of disposal at landfills that had not been surveyed in previous years. Disposal estimates (2004-2005) and projections (2007-2010) have been increased by this amount.
12. In a few cases, previously published 2004 and 2005 data has been updated to reflect more accurate information.



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# Current Fund Balance

The Tire Fund currently has a balance of \$41.7 million and is projected to increase to \$57.9 million by Fiscal Year 2009/10 (this large jump reflects the scheduled repayment in FY 2008/09 of \$17.1 million that was borrowed from the Tire Fund to meet General Fund obligations in FY 2003/04).

**Table 1: California Tire Recycling Management Fund  
History of Revenues, Expenditures and Balances**

	<b>Fiscal Year</b>	<b>Fund Balance (a)</b>	<b>Revenue</b>	<b>Expenditures</b>
<b>Actual</b>	FY 90/91	\$ -	\$ 2,395	\$ 790
	FY 91/92	\$ 1,605	\$ 3,625	\$ 2,087
	FY 92/93	\$ 3,156	\$ 3,459	\$ 4,495
	FY 93/94 (b)	\$ 2,187	\$ 1,171	\$ 3,358
	FY 94/95	\$ 1,339	\$ 4,066	\$ 3,819
	FY 95/96	\$ 6,219	\$ 4,329	\$ 3,744
	FY 96/97	\$ 6,803	\$ 4,853	\$ 5,452
	FY 97/98	\$ 6,561	\$ 5,700	\$ 7,842
	FY 98/99	\$ 4,111	\$ 6,078	\$ 4,599
	FY 99/00	\$ 5,774	\$ 5,854	\$ 10,531
	FY 00/01 (c)	\$ 938	\$ 15,947	\$ 4,496
	FY 01/02	\$ 14,688	\$ 32,097	\$ 29,039
	FY 02/03	\$ 18,121	\$ 32,904	\$ 28,302
	FY 03/04 (d)	\$ 26,275	\$ 17,046	\$ 30,814
	FY 04/05	\$ 17,776	\$ 36,487	\$ 31,235
	FY 05/06	\$ 27,838	\$ 38,732	\$ 30,738
	FY 06/07	\$ 40,462	\$ 42,328	\$ 35,323
<b>Proposed Budget</b>	FY 07/08	\$ 47,467	\$ 33,345	\$ 39,018
	FY 08/09 (e)	\$ 41,794	\$ 50,574	\$ 34,444
<b>Projected</b>	FY 09/10	\$ 57,924	\$ 33,683	\$ 34,444
	FY 10/11	\$ 57,163	\$ 34,197	\$ 34,444

- (a) The difference between one fiscal year's ending balance and the starting fund balance of the next year is due to prior year adjustments. Prior year adjustments are made during the budgetary process and may include additional revenue being reported after year-end disencumbrances of contracts, etc.
- (b) Revenue has been reduced to reflect the transfer of \$2.5 million to the General Fund, per Section 13.8 of the Budget Act of 1993.
- (c) Revenue reflects the increase of the tire fee from \$.25/tire to \$1/tire, effective January 1, 2001.
- (d) Revenue has been reduced to reflect a \$17.1 million loan to the General Fund.
- (e) Revenue reflects the proposed repayment of the \$17.1 million loan from the General Fund. Does not reflect pending \$4 million transfer to the ARB.

# Waste Tire Recycling Management Program

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The Tire Program has been at the forefront of expanding research and development of waste tire technologies and programs and continues to improve and build on its successes. The Board's enforcement efforts support tire diversion by creating a level playing field where illegal disposal is discouraged, thereby directing tires to legal disposal and diversion alternatives. The Tire Program has expanded its statewide enforcement infrastructure through its grants to local government enforcement entities. CIWMB is using sophisticated technologies such as satellite technology and motion-activated cameras to identify waste tire piles and to catch people illegally disposing of waste tires. The California Highway Patrol is working in partnership with the CIWMB to stop illegal hauling and stockpiling of waste and used tires. Further, the Waste Tire Hauler and Manifest Program has been redesigned to be simpler and more effective. These revisions to the Waste Tire Manifest Program have improved our ability to track the flow of tires, while simplifying and reducing the cost to stakeholders for manifesting and tracking tires as it begins to move into an electronic data transmission format.

CIWMB has completed the cleanup of California's two largest tire fires sites in Westley and Tracy. Our efforts with the Sonoma waste tire sites have resulted in five of the eight sites being cleaned up, while the remaining sites are anticipated to be cleaned up by the end of 2008. The program continues to clean up any known illegal tire piles through the Waste Tire Cleanup and Farm and Ranch Abatement grants. It is estimated that fewer than 250,000 tires remain in stockpiles throughout California.

The TBAP is currently working with a wide range of waste tire-related businesses to build a sustainable market for tire-derived products in California. This innovative program was designed to build an effective statewide infrastructure that will be able to respond to the ebbs and flows of a changing market through production management and product diversification. The program goes well beyond the former Tire Product Commercialization and Applied Technologies Grant Program, which was limited to providing funds for equipment purchases only. The TBAP offers a wide range of business services that are custom-tailored to each individual business. These services may include technical and consultative assistance for business plans and operations, marketing efforts, and testing and certification of new products.

The Board provides grants to certain public entities, specific private schools, and community housing development organizations for the purchase of tire-derived products (TDP) such as agricultural/landscaping, recreational, and transportation products.

Further, the Board educates and informs local jurisdictions about the benefits and incentives for rubberized asphalt concrete (RAC) and tire-derived aggregate (TDA). The Board has awarded more than \$10 million in grants to first-time RAC users. In addition, CIWMB has contracted with Chico State University to develop a waste tire engineering curriculum for RAC and TDA uses for use at universities and in continuing education for professionals.

The Board supports activities in the border region, conducted in coordination with the California Environmental Protection Agency, that include: 1) dedicating a portion of the funding for the Local Government Waste Tire Cleanup Grant Program for cleanups that occur along the California border region; 2) providing funding for a study of the tire flow to and from Mexico; 3) providing technical assistance for the development of an integrated waste tire management plan for the State of Baja

California, Mexico; 4) providing training workshops for teachers on the environmental education curriculum titled *Conservation and Pollution Prevention at a Shared Border*; 5) providing training and technical support to Mexico tire haulers; and 6) participating in Border 2012 Task Force, Resource Conservation Challenge Border Group, and the 2008 Border Governors Conference.

To measure the effective implementation of the tire program, the CIWMB has established Strategic Directives and adopted policies that contain the following goals:

- Increase the annual waste tire diversion rate to 90 percent by 2015.
- Conduct inspections according to statutory requirements and ensure that 100 percent of facilities are in compliance or under compliance orders by 2009.
- Eliminate all identified illegal tire piles by 2010.
- Reduce the number of tires generated by Californians from the current 1.1 (2005 baseline) to 0.75 per person per year by 2015.

Along with our current resources, the programs recommended by the Board in this report will further focus on activities that will provide a sustainable market for tire-derived products in California.

## Analysis

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The current Five-Year Plan allocates \$34 million for activities related to enforcement, cleanup, research, market development, and a hauler manifest system designed specifically to reduce the number of scrap tires going to landfills. A natural question thus is whether additional efforts and expenditures are needed to accomplish the mission of the CIWMB or whether current efforts are likely to increase the market sufficiently to handle most or all waste tires? As noted above, the Board projects that 83 percent of waste tires may be diverted by 2010, but these projections are based on many assumptions that may not be valid in the long term. Furthermore, current economic conditions may have a detrimental effect on existing efforts if TDP are not purchased in anticipated quantities. In addition, there will always be some tires that are not appropriate for the non-disposal market. For example, tires taken out of stockpiles typically are in such poor condition that the only viable options are uses as TDF or landfilling. Therefore, there will likely always be a need for some disposal capacity.

Whether or not there is agreement on the projection of 83 percent diversion by 2010, these considerations suggest that there is room for additional market stimulation, although not to the point where 100 percent of tires will be diverted. In some cases, the fundamental underlying market issue is that the lowest-cost management option is still landfill disposal. To address this, CIWMB staff developed a list of potential ideas to increase waste tire diversion rates and conducted an Interested Parties meeting on January 24, 2008, to solicit input from stakeholders on these options and any additional options.

Before describing the Board's recommendations in more detail, it is important to note that there is no easy way to accurately assess how effective potential options might be. Many of the proposals overlap in some manner and some may negatively impact aspects of the market that other proposals

are designed to stimulate. There also are a number of fundamental economic factors to consider. Even if the CIWMB provides a large amount of funding for a given option, it does not mean that the funds will necessarily be spent or achieve the desired market impact. For example, allocating additional funding to loans does not guarantee demand for that funding. If funding is provided indiscriminately, the program runs the risk of building short-term markets that will not be self-sustaining, which could have a more detrimental impact. Grants may be warranted to jump-start a market segment or selected product development in order to create long-term sustainable markets, but which grants make the most sense and how they can best be focused is continually being evaluated.

## **Recommendations to Increase the Rate of Diversion of Waste Tires from Disposal in Landfills**

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In general, the Board's approach has been to use the following criteria as a framework for suggesting specific funding options that should build outreach and market efforts so that tire diversion markets are strong and self-sustaining:

- Ability to deal with significant number of tires each year;
- Ability to affect greenhouse gas emissions/climate change;
- Ability to affect underlying market economics;
- Ability to foster source reduction efforts;
- Ability to overcome market obstacles and/or jump-start market segments (this could entail outreach, research, and use of funds to demonstrate the technical validity of processes and techniques that are not necessarily cost-effective at this time);
- Cost-effectiveness; and
- Statewide applicability (ongoing/statewide vs. one-time/statewide vs. one-time/local-regional).

Based on the above criteria and input from stakeholders, the Board recommends the following options:

### ***1. Expand Public Education and Outreach on Tire Sustainability/Retreads/RAC***

From 2005 to 2006 the number of tires that were generated in California increased by 2 million tires. One way to decrease tire disposal is to reduce the amount of tires that are generated annually. To help accomplish this, the Board suggests three ideas related to expanding public education and outreach.

First, maintaining a vehicle's tire pressure at the vehicle manufacturer's recommended specifications is a practical strategy to extend tire life and reduce the generation of waste tires, as well as to achieve early greenhouse gas (GHG) emission reductions. Current Federal law requires auto manufacturers to install tire pressure monitoring systems in all new vehicles beginning September 1, 2007.

The Board recommends expanding its current community education campaign that targets the general public with messages designed to: 1) educate drivers about proper tire maintenance in their older vehicles; 2) encourage customers to leave their old tires at the dealership when buying new tires; and 3) educate consumers about purchasing longer-lived tires.

Furthermore, the Board recommends partnering with the ARB on an outreach program to build onto existing tire outreach activities. The ARB has recently published its Early Action Measures to Reduce Greenhouse Gas Emissions in California. The report containing ARB's staff recommendation includes the following program:

**Tire Inflation Program:** This measure is recommended to be re-classified as a discrete early action measure. The strategy involves actions to ensure that vehicle tire pressure is maintained to manufacturer specifications. Specifically, the strategy seeks to ensure that tire pressure in older vehicles is monitored by requiring that tires be checked and inflated at regular service intervals. One potential approach would be to require all vehicle service facilities, such as dealerships, maintenance garages, and Smog Check stations, to check and properly inflate tires. It is also anticipated that signage at fueling stations clearly indicate the availability of compressed air at no charge. Staff also recommends that the feasibility of conducting an extensive outreach program be investigated.

This measure is scheduled to be heard by the ARB in January 2009.

Second, the Board could promote the retread tire market. Increasing the purchase of retreads for larger vehicles represents an additional outreach opportunity. While medium and heavy truck tires account for 7.3 percent of tire sales, because of their weight, they represent 27 percent of waste tire generation. Many of these tires could be retreaded one to four times if they were properly maintained, but unfortunately many are not maintained appropriately.

The CIWMB could conduct an aggressive maintenance outreach program focused on increasing the number of truck tire casings that are retreaded and increasing the number of retreaded tires purchased. This suggested outreach would target California-based trucking firms, fleet operators, companies with distribution facilities and others that represent the majority of trucks on the road. It could build on existing efforts with the Tire Retread Information Bureau (TRIB) to provide training to fleet managers of cities, counties and State Agencies on the benefits of retreading their commercial trucks (e.g., buses, fire, construction, ½ ton trucks, etc.). The goal for this outreach effort would be to reduce waste tires generated by 3.5 million Passenger Tire Equivalents (PTE) through one additional retread on 30 percent of medium and heavy truck tires. Two DVDs have been developed, one discussing the benefits of retreading and the other providing details on the step-by-step process of retreading tires at a facility. Along with the two completed DVDs, TRIB will be providing existing print material and a tire maintenance DVD. Additional outreach could include significant personal contact, technical assistance, and training.

Third, the Board could engage in a promotional and educational effort targeting the general public about the benefits of rubberized asphalt concrete in an effort to increase markets and decrease the amount of waste tires. This effort would generate interest and promote advocacy to encourage local elected officials and decision makers to increase the use of RAC within their respective jurisdictions, as well as to increase use of RAC for roads/highways controlled by the California Department of Transportation (Caltrans).

Activities would target residential communities and homeowners through various community groups and community leaders. This targeted audience would include those who would be most interested in RAC's benefits, including noise reduction, aesthetics, and cost-effectiveness for the jurisdiction and community, as well as the environmental benefits.

The message can reach these target audiences using grass roots measures such as specialized websites, community speaking opportunities, material distribution through local venues, and local access broadcasts.

The Board suggests that \$1-3 million per year for three years be allocated to expand public education and outreach about tire sustainability/inflation activities, implement outreach activities to increase the use of retreads by targeting larger truck fleets, and engage a public outreach campaign to promote the use of RAC at the local and state levels. In addition, staff resources of one personnel year (PY) would be required to implement these projects.

## **2. *Establish New Equipment Loan Program***

Due to the success of a demand-pull approach and improved market intelligence, the Board has identified 3-4 million PTE demand in California that is currently being served by out-of-state processors. The Board believes that additional, unidentified demand is present in California and that additional planned market development activities will increase demand for higher value-added materials. In order to satisfy this demand and divert significant quantities of tires from landfills, three things are needed: 1) additional processing capacity and diversification; 2) molds, presses, and other manufacturing equipment to produce new and innovative products; and 3) appropriate product testing services to ensure quality products and market acceptance. This latter need can be addressed through the existing TBAP.

In order to encourage the timely siting of these facilities and/or expansion of manufacturers, the Board suggests establishing a new equipment loan program to provide appropriate low-interest loans, consistent with the existing Recycling Market Development Zone (RMDZ) Loan Program. All eligibility, terms and conditions would be consistent with the RMDZ Loan Program, except loans would be available anywhere in the state to viable businesses that make TDP and have the ability to market their products. Based on information from industry representatives, new equipment and siting for a processor ranges from \$1.50 - \$2.50 per PTE processed per year (\$3-5 million for a facility capable of processing 2.5 million PTE), molds for a manufacturer can run tens of thousands of dollars each and necessary production equipment can cost hundreds of thousands of dollars.

Such a program would provide loans to businesses for new equipment. Loans for shredding tires at landfills and monofills would only be for activities designed to divert shredded material for tire-derived products. The success of the CIWMB's TDA program is increasing demand in the TDA market to the point that the number of TDA projects is limited by the amount of TDA that can be produced during a given period. Unfortunately, there are only a limited number of tire processors who have the capability to make TDA to the appropriate specifications. Therefore this loan program would target existing tire processors who are not currently making TDA and provide them with technical and financial support to diversify their operations to produce TDA. Funding would be tied directly to efforts to increase processing of waste tires and production of final products. The use of loans (as opposed to grants) will ensure that processing/production decisions are based on a reasonable business justification and market demand rather than the availability of grant funding.

The Board suggests funding a new equipment loan program at a level of \$3-5 million per year for three years and then evaluating the need for additional funding in subsequent years. In contrast to grants, these funds would flow back into the fund as loans are repaid over a ten-year period. One and a half PYs of the classification Loan Officer would be required to implement this program.

### **3. *Increase TDA/Civil Engineering Efforts***

Due to the success of the CIWMB's outreach efforts to promote the use of TDA in CE applications, Caltrans and many local governments have experienced the benefits first-hand. These outreach efforts have encouraged lightweight fill applications such as: the Dixon Landing interchange project in Milpitas; the retaining wall projects in Riverside County; the Marina Drive slope stabilization project in Mendocino County; the Valley Transportation Authority vibration attenuation project in Santa Clara County; and landfill gas collection systems in which TDA was used as a replacement for conventional gravel. In all of the engineering challenges posed in these projects, TDA provided a viable alternative to the conventional technology that is typically used, but at a substantial cost savings.

In an effort to continue to stimulate demand for TDA, but with the intent to avoid permanent subsidies, the Board recommends three new activities. Based upon past TDA projects, the Board estimates that each project supported under this program will use an estimated 50,000 to 500,000 PTEs.

The first activity is to increase the level of support to the CIWMB's Civil Engineering Services contracts and interagency agreements that provide technical assistance and construction management support for actual Caltrans and local government TDA projects.

The second activity is to research new applications to further enhance the markets for TDA. One potential research effort being pursued by the CIWMB is a partnership with Caltrans to conduct a seismic damping in highway structures.

The third activity is to implement a new CE/TDA Application Grant Program for local governments. This grant program would enhance the CIWMB's efforts to promote the use of TDA by allowing the CIWMB to partner with local governments to construct projects that will demonstrate the benefits of using TDA. These demonstration projects would be used to educate other local governments, engineers and contractor of the benefits of TDA.

One potential challenge that may hinder the CIWMB's efforts to promote CE/TDA applications is the limited amount of TDA that is currently being supplied by existing tire processing facilities. There are currently only three processing facilities that can manufacture TDA material to the specification required for typical projects, one in Southern California and two in Northern California. Also, the drastic increase in fuel costs has significantly increased the cost of delivering TDA to project sites. Therefore, in the short term, the CIWMB must carefully stage potential CE/TDA projects to ensure that the material will be available when the project is ready for construction. However, a long-term solution would be the creation of new tire processing facilities to meet future demand that is being driven by CE/TDA outreach efforts and to provide competitive pricing that will ultimately make TDA more cost-effective. This can be addressed at least in part through establishment of a new equipment loan program (see option 2 above) and technical assistance from the CIWMB's existing TBAP.



These program enhancements would allow the Board to continue to promote the use of TDA as an economically viable alternative to conventional materials typically used in CE applications, thus moving TDA towards long-term market sustainability. Using TDA will also help protect the environment by preventing the need to use new construction materials (i.e., lightweight shale, Styrofoam, new aggregate, vibration attenuation technology, aggregate, etc.).

The Board suggests expanding the CE/TDA program with a total of \$3-5 million per year for four years. Staff resources needed to implement these projects would be three PYs.

#### **4. *Increase RAC Grant Programs***

The CIWMB has been successful in promoting the use of RAC through its technical outreach and grant programs. In recent years, the CIWMB's RAC efforts have been focused on the RAC Use and the Targeted RAC Incentive (TRI) Grant Programs. The Targeted RAC Incentive Grants are for local governments who are first-time users. The CIWMB also provides technical assistance to the first-time users. The RAC Use Grant Program provides rewards to those local governments that are ongoing users. Although both programs have been successful, the Board recognizes the need to refocus RAC efforts to further increase RAC use.

The Board suggests that the RAC grant programs should include a cooperative purchase opportunity for rural jurisdictions. In many rural jurisdictions, especially those with small populations, the budget for road maintenance is not large enough to facilitate the use of RAC. These jurisdictions typically use a relatively small amount of paving material that is insufficient to attract bids from RAC suppliers. One solution is for several rural jurisdictions to partner together and combine their small individual projects into a one larger project/bid, thereby attracting RAC suppliers.

As the Board steps up its RAC outreach to community groups to increase use of RAC for roads/highways controlled by Cal-Trans, an increase in RAC grant funding is warranted. The Board recommends an additional \$3-5 million for RAC grants for the first two years and \$1-2 million for the following year. Staff resources needed to implement these grants would be one PY.

#### **5. *Expand TDP Grant Program***

The Tire-Derived Product Grant program is a very popular program that is oversubscribed each year and that has a maximum cost per tire of \$5. In late 2007, staff conducted a survey of grant recipients in which half of the respondents indicated that they had purchased products with their own funds. Of those who indicated they had not purchased products with their own funds, 29 percent said they would in the near future. The Board has already directed staff to expand applicant eligibility to community housing and school programs and to conduct additional outreach to these entities. This program has been oversubscribed the past three years. In FY 2005/06, \$1,792,818 was allocated and the Board received \$4,148,608 in requests for projects that had a cost per tire of \$10 and under. In FY 2006/07, \$2,400,000 was allocated and the Board received \$4,264,428 in requests for projects that had a cost per tire of \$5-\$7. And this year, \$2,400,000 was allocated and the Board received \$3,876,043 in requests for projects that had a cost per tire of \$5 and under.

Beginning in FY 2008/09, the Five-Year Plan decreases program funding to \$2 million annually through FY 2011/12. Since the program has been oversubscribed for the last three years, the Board suggests increasing funding for the program by \$1-3 million per year for three years, and then re-

evaluating it to determine the need for additional grant funding. If this program is expanded, staff resources would need to be increased by one-two PYs to accommodate the additional grant workload.

## **Statutory Changes to Assist the Board's Efforts to Increase the Diversion Rate**

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Tire diversion in California is at 74 percent. Nationally, tire diversion is at 87 percent, largely due to the use of waste tires as tire-derived fuel.

Each PTE contains 7 gallons of oil. With 11 million tires a year still being landfilled, that is the equivalent of burying 77 million gallons of oil each year. With the cost of oil and coal skyrocketing, research on tires as a valuable energy-producing commodity is warranted.

Also, as California strives to be a zero waste state, we need to consider alternatives to landfilling for used TDP, from playground covers to door mats. Used TDPs are typically in such poor condition that the only viable end-of-life option is landfilling. Future research could prove them to be a valuable source of energy.

The following are statutory changes that would assist the Board's effort to increase the diversion rate:

### **1. Revise PRC Section 42889.4**

Revise Public Resources Code (PRC) Section 42889.4 to require that the California Air Resources Board (ARB) conduct an analysis comparing emissions from facilities in which tires are incinerated with emissions from the same facilities when they are burning other types of materials. This analysis would be included in the ARB's *Annual Report on Air Emissions from Waste Tire Burning in California*.

PRC Section 42889.4 currently requires the ARB to prepare a report summarizing the types and quantities of emissions associated with the incineration of waste tires in California. ARB works in conjunction with air management districts and air pollution control districts to assemble the data for this report, which is posted on the ARB website at <http://www.arb.ca.gov/research/apr/reports/l3040.pdf>. Over the years, citizen groups and environmental organizations have expressed concerns about emissions from tire incineration facilities. The ARB, through its local districts, could address this concern by testing emissions from facilities when tires are being incinerated and compare those emissions from the same facilities when they are burning other types of materials. Such a study would determine whether incinerating tires increases or decreases pollution emitted during combustion.

### **2. Delete PRC Section 42873 (b)(1)**

If deleted, the Board could fund climate change studies evaluating greenhouse gas reductions from the increased use of tires in comparison to the current use of coal as fuel in cement manufacturing or in energy production.

PRC Section 42873 (b)(1) (Budget Bill of 2003) prohibits the Board from expending tire funds for any activities that provides support or research for tire incineration. TDF markets could use many of

the tires that are currently being disposed, and there are significant greenhouse gas reductions that could be realized by using waste tires as fuel. Using information from a United States Environmental Protection Agency study on TDF, (<http://epa.gov/climatechange/wycd/waste/downloads/ScrapTires5-9-06.pfd>), the Board estimates that reductions of 12,000 MTCO<sub>2</sub>e can be achieved for every one million PTE diverted from landfills used as TDF. When used under properly controlled conditions, TFD can be more efficient and a cleaner source of energy than coal.

### **3. *Revise PRC Section 42889.3***

Revise PRC Section 42889.3, which currently requires Caltrans to report each year to the Legislature and the Board on the use of waste tires in transportation and civil engineering projects during the previous five years, including but not limited to, the approximate number of waste tires used every year, and the types and location of these projects. PRC section 42889.3 could be amended to require Caltrans to include in its report the number of **California**-generated waste tires used in its projects each year.

# Summary of Options and Resources

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Below is a summary of the costs associated with the above mentioned recommendations. In addition, it is estimated that six to seven and a half additional staff will be needed to implement these options, at an estimated cost of \$577,353 - \$842,363. *The Board will review the effectiveness of these programs during 2013 in anticipation of legislative discussions regarding the 2015 sunset date of the tire recycling management fee.*

Table 2: Summary of Recommendations

OPTIONS	Year 1 FY 09/10	Year 2 FY 10/11	Year 3 FY 11/12	Year 4 FY 12/13
1. Expanding Public Education and Outreach on Tire Sustainability/Retread/RAC	\$1-3M	\$1-3M	\$1-3M	\$0
2. Establish New Equipment Loan Program	\$3-5M	\$3-5M	\$3-5M	\$0
3. Expanded Civil Engineering/TDA Efforts	\$3-5M	\$3-5	\$3-5M	\$3-5M
4. Increase RAC Grant Programs	\$3-5M	\$3-5M	\$1-2M	\$0
5. Expand TDP Grant Program	\$1-3M	\$1-3M	\$1-3M	\$0
<b>TOTAL DOLLARS</b>	<b>\$11-21M</b>	<b>\$11-21M</b>	<b>\$9-18M</b>	<b><del>\$4M</del> \$3-5M</b>

## Implications for Fund and Fee

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The State Board of Equalization (BOE) collects a \$1.75 fee on every new tire purchased in California. BOE transfers \$0.75 of each tire fee to the Air Pollution Control Fund. The ARB expends these funds to local air districts for programs and projects that mitigate or remediate air pollution caused by tires in the state. This disbursement will continue until the ARB or the local districts determine that the program or projects remediate air pollution harms created by tires. The remaining \$1.00 is transferred to the CIWMB to fund the Tire Program. The fee is to sunset on January 1, 2015. The Board recommends that the tire fee be re-evaluated no later than 2013 to determine at that time if the tire fee should be adjusted and extended.

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